**IBRTF Report To ROS**

**March 2022**

**Chair: Mohammad Albaijat, Vice-Chair: Julia Matevosyan**

**IBRTF last met on June 10 and July 8, 2022 (Webex)**

**June 10th Meeting**

**Discussion Items:**

**Status Update on Odessa Disturbance 2**

* Presented by Patrick Gravois (ERCOT)
* New large disturbance on June 4th 2022, in Odessa area:
	+ Event initiated by lightning arrestor fault on 345 kV level in Odessa area on June 4th at 12:59:25 PM
	+ Preliminary estimated loss of 2,519 MW of thermal (853 MW) and Solar (1,666 MW from 14 facilities) generation
	+ Lowest and highest recorded voltage is within VRT “No Tripping” zone as per NOG 2.9.1
	+ System Frequency declined to 59.706 Hz and recovered to 60 Hz in 1 min 20 sec (1,227 MW of RRS deployed, 1,116 MW of Load Resources deployed)
	+ 9 of the 14 lost generation resources in prior Odessa event May 2021
	+ 3 inverter manufactures identified (same as in previous Odessa event)
	+ Categorized as NERC Cat 3 event (gen loss > 2000 MW), NERC event analysis follows.
	+ ERCOT analysis and follow up ongoing. Discussion around disclosing information about inverter OEMs involved led to the idea of closed meeting portion as PDCWG. IBRTF will discuss logistics at August IBRTF meeting.

**TSAT Model Quality Test**

* Yunzhi Cheng (ERCOT) provided status update
* 15% of IBRs still have not provided validated TSAT models
* Primarily issues associated with provision of valid user-defined models
* Discussion on the need for model validation if PSS/E generic model is converted to TSAT

**NPRR1138 Communication of Capability and Status of Online IRRs at 0 MW Output**

* Presented by Freddy Garcia (ERCOT)
* NPRR requires each Resource Entity to ensure that the reactive capability curve submitted for any IRR accurately reflects the IRR’s reactive capability when it is not providing real power and at lower levels of real power output.
* Discussion around associated active power consumption while providing reactive capability at 0 MW output and need for certain LSL level to be able to do that. This is likely to be OEM specific and OEM attestation can be used to verify these parameters.

**July 8th Meeting**

**OEMs perspective on IEEE2800 implementation**

* Presented by Samir Dahal (Siemens Gamesa Renewable Energy)
* Comments provided by Stephen Wurmlinger and Ravi Dodballapur (SMA)
* A good portion of requirements outlined in IEEE2800 is already built into state-of-the-art inverters. Some requirements that are more challenging technically but also from implementation/conformity testing perspective (ahead of IEEE2800.2). These are e.g. multiple fault ride through, transient overvoltage ride through capabilities etc. Large number of inverters is already contracted for the projects that are currently in generation interconnection pipeline, these will require some kind of transitional arrangements. It’s hard for manufacturers to self-attest that inverter is IEEE2800 conformant since the requirement applies at the POI and conformity depends on the entire plant design. Coordination needed between, inverter manufacturer, plant controller manufacturer and plant developer to ensure conformity. Overall OEMs are supportive of harmonized interconnection requirements across the country and willing to collaborate on developing an implementation roadmap.

**Gap Analysis between IEEE2800 and Nodal Protocols**

* Presented by Jens Boemer and Deepak Ramasubramanian (EPRI)

**June 4th Odessa Event Update**

* Presentedby Stephen Solis (ERCOT)
* Updated MW amount of solar plants that was lost 1,709 MW
* About 60% of solar inverters in ERCOT system are from the 3 OEMs involved in this and previous Odessa events.
* Issues with PMU/High Resolution Relay data availability. Entities appear to be out of compliance with NOG 6.1.3. ERCOT begins to work on improving the requirements.
* Causes of tripping similar to the previous event with about 65% attributed to the following three causes: AC Overcurrent, Volt Phase Jump, AC Overvoltage. ERCOT provided details for every cause of MW loss and every plant involved.
* Next Steps:
	+ NERC Brief Report to be submitted to TRE on Monday, 7/11
	+ Beginning August to discuss investigation results/corrective action plans
	+ Review unit responses for rest of solar farms that submitted data to

estimate losses during LVRT

* + ERCOT will require sample PMU data to be submitted from all entities

that did not provide data

* + Submit Protocols and Operating Guide Revision Requests to enhance

ride through requirements and PMU/DFR requirements.

**Industry Update**

* Presented by Julia Matevosyan (ESIG, IBRTF vice-chair)
* NERC Reliability and Security Technical Committee approved Standard Authorization Request (SAR) on inclusion of EMT models and studies in planning related NERC Standards (MOD-32, TPL-001 and FAC-002)
* NERC sponsored a SAR to retire PRC-024-3 and replace it with a **performance-based ride-through standard** that ensures generators remain connected during system disturbances. The goal is to mitigate the systemic performance issues identified by NERC. These issues in many cases are unrelated to voltage and frequency protection settings as dictated by the currently effective version of PRC-024.
* Five grid forming batteries were awarded to provide stability services in Great Britain. The focus was on increasing SCR levels but also substitute for diminishing inertia. These resources will have to comply with recently approved Minimum Specification Required for Provision of GB Grid Forming (GBGF) Capability. In-service date – April 2024.
* EPRI\* [White Paper](https://www.epri.com/research/products/000000003002025063): “Differentiating between Applicability of Simulation Domains and Inverter Mathematical Models in these Domains